SITE HEALTH AND SAFETY PLAN

Site: **NAVAL AIR WARFARE CENTER**

Location: **SITE 4, WARMINSTER, PA**

Prepared By: **FOSTER WHEELER ENVIRONMENTAL CORPORATION**

Date Prepared: **MAY 13, 1996**

Revision: **O**

Project Description: **REMEDIAL ACTION INVOLVING SOIL, WASTE, SLUDGE REMOVAL**

Delivery Order #: **0018**

Waste Types: Solids, Viscous
Characteristics: Volatile, toxic
Status: Active, Military
Background Review: Complete
Overall Hazard: Moderate

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APPROVALS

By their signature, the undersigned hereby certify that this SHSP has been reviewed and approved for use at Site 4 NAWC Warminster, PA.

E. R. Lamont — 5/13/96

SENIOR PROJECT MANAGER/ENGINEER — DATE

Greg P. Cyr — 5/13/96

PROJECT HEALTH AND SAFETY MANAGER — DATE

SITE HEALTH AND SAFETY OFFICER — DATE

1.0 INTRODUCTION

1.1 Purpose

This Site Health and Safety Plan (SHSP) addresses the health and safety practices that will be employed by all site workers participating in excavation activities at the Naval Air Warfare Center (NAWC) Warminster, PA. The SHSP takes into account the specific hazards inherent to soil and sludge removal and presents procedures to be followed by Foster Wheeler Environmental Corporation, its subcontractors, and all other on-site personnel in order to avoid and, if necessary, protect against health and/or safety hazards. Activities performed under this SHSP will comply with applicable parts of OSHA Regulations, primarily 29 CFR Parts 1910 and 1926, USACOE EM 385-1-1, Navy/Marine Installation and Restoration Manual and the Foster Wheeler Environmental Corporation Health and Safety Program Manual. Many programs from the manual are referenced in this SHSP but are not included. A copy of the manual will be maintained at the site. Modifications to the SHSP may be made with the approval of the PHSM using the Field Change Request Form found in Appendix A.

1.2 Scope

1.2.1 Site 4

This SHSP has been developed to address health and safety concerns during excavation activities at Site 4. There are 8 trenches covered with 3 feet of clean soil which require removal of contaminated soil and sludge. Approximately 11,000 cy of soil must be excavated of which 3,000 cy can be used as backfill at the site, 4,000 cy will be disposed as solid waste/debris and the remaining 4,000cy will be disposed at a RCRA Subtitle C landfill.

The scope of work requires the following tasks:

Task 1Site Mobilization

- Construction of a clean gravel road to be left in place following project termination;
- Installation of a temporary decontamination pad for the trucks and heavy equipment;
- Construction of stockpile areas for soil to be reused as backfill; and
- Installation of temporary site support facilities (trailer office and storage, sanitary facilities, electric, phone, office equipment, etc).

Task 2 Pre-Mobilization Sampling/Surveying

- Survey trench layouts; and
- Conduct soil sampling using split spoons in order to profile the soil/waste for direct loadout (40 composite samples collected via drill rig). Borings are anticipated to be up to 8 feet deep.

Task 3 Strip Topsoil

- Remove topsoil from 8 trenches; and
- Stockpile topsoil.

Task 4 Excavation/Confirmatory Sampling

- Excavation of trenches will occur in the following order to avoid cave-ins and increase the area available for soil stockpiling: Trench 7, Trench 5, Trench 3, Trench 1, Trench 6, Trench 4, Trench 2, and Trench 0.
- Collect post-excavation samples
- Collect stockpile soil samples to determine soil reuse

Task 5 Backfill/Topsoil/Hydroseed

- Backfill each trench following receipt of post-excavation confirmatory samples (Compaction will be performed with an excavator bucket and/or track mounted dozer); and
- Replace topsoil and hydroseed.

A Site Supervisor, a Site Health and Safety Officer (SHSO) and four craft personnel will be required to perform the excavation, loadout and backfill over a seven-week period. The pre-mobilization sampling/surveying will be performed over a one week period.

1.3 Application

The SHSP applies to all personnel involved in the above tasks who wish to gain access to active work areas, including but not limited to:

- Client representatives;
- Federal, state or local representatives; and
- Foster Wheeler Environmental employees and subcontractors.

1.4 Summary of Major Risks

- Exposure to contaminants;
- Operation of heavy equipment (bucket loader and excavator);
- Operation of hot pressure washer; and
- Heat Stress.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

This section specifies the Foster Wheeler Environmental Project Organization. Foster Wheeler Environmental will manage the project.

2.1 Senior Project Manager/Engineer

The Project Manager is Edward Leonard.

- Has the overall responsibility for the health and safety of site personnel;
- Ensures that adequate resources are provided to the field staff to carry out their responsibilities as outlined below.
- Participates in periodic inspections.

2.2 Project Superintendent

The Project Superintendent will be determined at a future date.

- Ensures that the Site Health and Safety Plan is implemented in conjunction with the designated Project Health and Saftey Manager (PHSM) and SHSO;
- Ensures that field work is scheduled with adequate personnel and equipment resources to complete the job safely;
- Ensures that adequate telephone communication between field crews and emergency response personnel is maintained;
- Ensures that field site personnel are adequately trained and qualified to work at the site;
- Enforces site health and safety rules;
- Investigates major incidents;
- Conducts periodic site inspections; and
- Establishes initial communication with NOSC, LEPC, etc.

2.3 Project Health and Safety Manager

The PHSM is an individual certified by the American Board of Industrial Hygiene (CIH) or the Board of Certified Safety Professionals (CSP) with experience in hazardous waste site remediation activities. The PHSM for the site is Grey Coppi.

- Provides for the development and approval of the SHSP;
- Serves as the primary contact to review health and safety matters that may arise;
- Approves revised or new safety protocols for field operations;
- Coordinates revisions of this SHSP with field personnel;
- Assists in the investigation of major accidents; and
- Conducts periodic inspections for compliance with the SHSP.

2.4 Site Health and Safety Officer

The SHSO will be determined at a future date.

- Directs and coordinates health and safety monitoring activities;
- Ensures that proper personal protective equipment is utilized by field teams;
- Conducts and documents daily safety briefings;
- Monitors compliance with this SHSP;
- Notifies PHSM of all accidents/incidents;
- Coordinates with the CS and PM in any accident/incident investigation;
- Completes and maintains Accident/Incident Report Forms;
- Determines upgrade or downgrade of personal protective equipment (PPE) based on site conditions and/or real-time monitoring results;
- Ensures that monitoring instruments are calibrated;
- Reports to PHSM to provide summaries of field operations and progress; and
- Maintains health and safety field log books.

2.5 Site Personnel

- Report any unsafe or potentially hazardous conditions to the SHSO;
- Maintain knowledge of the information, instructions and emergency response actions contained in the SHSP;
- Comply with rules, regulations and procedures as set forth in this SHSP and any revisions;
- Prevent admittance to work sites by unauthorized personnel; and
- Inspect all tools and equipment, including PPE, daily prior to use.

3.0 BACKGROUND AND SITE DESCRIPTION

3.1 Background and Site Description

NAWC Warminster was originally the location of Brewster Aeronautical Corporation, a manufacturer of military aircraft. Since the 1940s, the main mission at the base has been research, development, testing, and evaluation for Naval aircraft systems. The base also conducts studies in anti-submarine warfare systems and software development. NAWC Warminster is scheduled for realignment under the Base Realignment and Closure Program managed by the Department of Defense. The realignment will result in relocation of NAWC Warminster activities to Naval Air Station (NAS) Patuxent River, Maryland.

To date, at least eight known locations on current NAWC Warminster property have been identified as sites used for the disposal of wastes containing hazardous substances. None of the sites is currently used for waste disposal.

3.1.1 Site 4

Site 4 is a grassy area covering 7 acres just north of the main runway along Kirk and Newton Roads and south of the Base Patrol Road. The site is located at approximately the mid-point of the runway in the northeastern portion of the base. An unnamed tributary of Lettle Neshaminy Creek is located north of this area, and residential areas and two local parks are also in this direction.

Site 4 is the largest known waste disposal location at NAWC Warminster; it is less than 100 feet from the edge of the facility boundary. Site 4 reportedly was operated from 1966 to 1970. Several trenches at the site were reportedly used to dispose non-industrial solid waste, paint, waste oil, waste metal, construction debris, solvents, general refuse, office trash, and sewage sludges from the industrial wastewater treatment plant.

3.2 Site Characterization Data

3.2.1 Site 4

In April 1995, site characterization data was gathered and compared with previous data to determine the locations, nature, and extent of contamination at Site 4. This data was used in conjunction with data already gathered from previous investigations and studies. A field investigation was performed as part of a Phase III Remedial Investigation (RI) activity at NAWC Warminster to better characterize the site and to estimate the volume of landfill material contained within Site 4.

Based upon field investigations performed by Haliburton NUS, there are 8 trenches at Site 4 and each trench is about 12 feet wide, 8 feet deep, and between 150 to 490 feet in length. The previous investigations indicated that, all confirmation and subsurface soil sample borings at Site 4 placed within the trenches encountered waste material, and borings placed between trenches encountered only fill. The subsurface fill within the trenches averaged 4 to 5 feet in thickness.

Refuse, consisting of paper, plastic products, soda and beer cans, glass bottles, styrofoam, cardboard, and photographic film was found in nearly all test pits and trenches at Site 4. Construction/demolition debris, consisting of wood, metal, concrete, brick, cables, wire, and steel was also encountered in two trenches.

A majority of the waste contained in the Site 4 trenches consists of construction debris, demolition materials, and general refuse. These wastes typically are not considered to be hazardous. However, NUS' investigation of soils, sediments, groundwater, and surface water suggest that wastes buried in the trenches may be the source of hazardous substances that have been released to the environment or could be released.
The major chemicals of concern for surface soils are Aroclor 1248, trichloroethene (TCE), pentachlorophenol (PCP), and several polycyclic aromatic hydrocarbons (PAHs) such as benz(a)anthracene, benzo(b)fluoranthene, and benzo(a)pyrene. Several metals (beryllium and manganese) were detected above background concentrations or screening criteria for surface soils.

For subsurface soils, the chemicals of concern include PCP, benz(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, dibenz(a,h)anthracene, Dieldrin, Endosulfan Sulfate, Aroclor 1248, and Aroclor 1254. In addition, several metals (barium, beryllium, cadmium, manganese, and nickel) were detected above background concentrations or screening criteria for subsurface soils.

Based upon site characterization information developed by NUS, migration of buried materials and hazardous substances has not occurred from the eight trench locations identified at Site 4. This conclusion is supported by the lack of significant groundwater contamination in the vicinity of the site, along with the lack of subsurface contamination between trenches. Appendix B includes a table of contaminants detected at Site 4 derived from the field investigation.

4.0 POTENTIAL HAZARDS OF THE SITE

This section presents an assessment of the chemical, physical and biological hazards that may be encountered during the tasks specified in section 1.2. Additional information may be found in Appendix C-Activity Hazard Analyses (AHA).

4.1 Properties of Chemical Contamination

4.1.1 Site 4

The contaminants of concern in surface and subsurface soils include volatile and semi-volatile compounds such as (TCE, PCP, and PAHs (benz(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, and dibenz(a,h)anthracene); metals (barium, beryllium, cadmium, manganese and nickel); and pesticide/PCBs (Dieldrin, Endosulfan Sulfate, and Aroclor 1248 and 1254).

Table 4.1 contains a summary of the toxicological and physical properties of the chemical compounds that may be encountered during the removal activities.

Exposure to these compounds may occur through inhalation of contaminated dust particles, inhalation of volatile and semivolatiles, dermal absorption, skin contamination, or accidental ingestion of the contaminant.

The action levels for volatile and semivolatile compounds chosen were based upon the known concentration of contaminants, physical and chemical properties, toxicity, and distribution of these compounds at the sites. The predominant volatile at this site is TCE and the predominant semivolatiles are PAHs. Due to the vapor pressures of these chemicals, inhalation is the primary route of exposure. Skin absorption is also a possible route of exposure, leading to the same symptoms as inhalation overexposure. These compounds are potent narcotics and may cause central nervous system (CNS), lung, and blood vessel damage. These compounds may have a synergistic effect when combined with alcohol.

TCE is a clear, colorless liquid with characteristic sweet odor of chloroform. Exposure to TCE may occur through inhalation, contact and ingestion. The acute exposure may result in headaches, vertigo, visual disturbances, tremors, nausea, vomiting, eye irritation, and dermatitis. Fatalities following severe, acute exposure have been attributed to ventricular fibrillation resulting in cardiac failure. Damage to the liver and other organs may result from chronic exposure. TCE is a suspected carcinogen.

PCP consists of dark-colored flakes and sublimed needle crystals with a characteristic odor. Exposure to pentachlorophenol may occur through inhalation, contact, ingestion and absorption. Acute exposure symptoms include irritation of eyes, nose, and throat, sneezing, coughing, weakness, sweating, headaches, dizziness, nausea, vomiting, dyspnea, chest pains, high fever, and dermatitis. It is a suspected human carcinogen. Chronic exposure can cause liver and kidney injury.

Metals present a high potential for exposure to field personnel. The route of exposure from metals is via ingestion of dust or inhalation of dust or fumes. The effects include eye and skin irritation, upper respiratory effects to the central nervous system and to the reproductive system. Metal poisoning may result from cumulative action; therefore, smoking, drinking or eating is prohibited in work areas where dust is produced. The exposure via inhalation or ingestion is considered to be low when good personal hygiene and dust control methods are implemented according to this plan.

PCBs pose a potential health risk through dermal exposure to PCB-laden oil or waste. Exposure through this route can cause chloracne, a severe skin disorder. Eye contact with PCBs can cause irritation and discharge. Overexposure via inhalation can lead to irritation of the respiratory tract, vomiting, jaundice, and abdominal pain. PCBs are persistent, lipophilic substances (strong affinity for lipids {fat cells}) which have a tendency to bioaccumulate.

Pesticides are grouped according to their chemical nature or use as organic phosphates, carbamates, fungicides, herbicides, fumigants, and few other miscellaneous. The most common route of exposure is ingestion. Other routes of exposure include inhalation and skin and eye absorption. The health effects vary greatly dependent upon their mechanism of toxic action. Organo phosphates and carbamates are enzyme inhibitors. Chlorinated hydrocarbons, herbicides and rodenticides are CNS depressants or stimulants. Most are skin and eye irritants. Some compounds cause gastroenteritis, liver and kidney damage, encephalophathy, neuritis, ataxia and alopecia. The possibility of exposure via inhalation or ingestion is low to moderate. The possibility of skin contact is greater.

4.2 Physical Hazards

Most physical hazards are discussed in the AHA in Appendix C for the different phases of this project.

4.2.1 Noise

Noise is a potential hazard associated with the operation of heavy equipment and pressure washers. Suspected high noise operations will be evaluated by SHSO to determine if hearing protective devices are warranted. All employees receive audiograms as part of the pre-employment physical examination.

4.2.2 Construction Safety Hazards

Most physical hazards are discussed in the AHA for the different phases of this project. Generally, they are typical of construction work. The hazards may arise from poor housekeeping; heavy equipment operation; soil excavation; the use of hand and portable power tools; handling and storage of fuels; the installation and use of electrical power; work on elevated work surfaces or uneven terrain.

Table 4.1 Che Data

COMPOUNDS	CAS#	ACGIH TLV	OSHA PEL	ROUTES OF EXPOSURE	SYMPTOMS OF EXPOSURE	TARGET ORGANS	CHEMICAL PROPERTIES
Aroclor 1248 (PCB)	1267-29-6	.001 mg/m^3 NIOSH REL	--	Inhalation Ingestion Contact Absorption	Irritates eyes and skin; chloracne; potential carcinogen	Skin, eyes, liver, reproductive system	Colorless to pale-yellow, viscous liquid or solid
Aroclor 1254 (PCB)	11097-69-1	.5 mg/m^3	.5 mg/m^3	Inhalation Ingestion Contact Absorption	Irritates eyes and skin; chloracne; carcinogen	Skin, eyes, liver, reproductive system	Colorless to pale-yellow, viscous liquid or solid
Barium	7440-39-3	.5 mg/m^3	.5 mg/m^3	Inhalation Ingestion	Vomiting, colic, diarrhea, slow irregular pulse, transient hypertension, convulsive tremors and muscular paralysis; irritates eyes, skin and upper respiratory system; and skin burns	Eyes, skin, respiratory system, heart, CNS	White, odorless solid
Beryllium	7440-41-7	.002 mg/m^3	.002 mg/m^3	Inhalation	Respiratory symptoms, weakness, fatigue, weight loss, potential carcinogen	Eyes, skin, respiratory system	Metal: a hard brittle, gray-white solid
Cadmium	7440-43-9	.002 mg/m^3	.005 mg/m^3	Inhalation Ingestion	Pulmonary edema; dyspnea; cough; chest tightness; substernal pain; headache; chills; muscle aches; nausea; vomiting; diarrhea; carcinogen	Respiratory system, kidneys, prostate, blood	Metal: silver-white, blue-tinged lustrous, odorless solid
Coal Tar Pitch Volatiles (PAHs)	65996-93-2	.2 mg/m^3	.1 mg/m^3	Inhalation Ingestion Contact	Carcinogen, dermatitis, bronchitis	Respiratory system, skin, bladder, kidneys	Black or dark-brown morphous residue; properties vary depending on compound
Dieldrin	60-57-1	.25 mg/m^3	.25 mg/m^3	Inhalation Ingestion Contact Absorption	Headaches, dizziness; nausea, vomiting, malaise, sweat; myoclonic limb jerks; convulsions; coma, carcinogen	CNS, liver, kidneys, skin	Colorless to light-tan crystals with a mild chemical odor
Endosulfan Sulfate (as Endosulfan)	115-29-7	.1 mg/m^3	--	Inhalation Ingestion Contact Absorption	Irritates skin; nausea, confusion, agitation, flushing, dry mouth, tremors, convulsions, and headaches	Skin, CNS, liver, kidneys, respiratory system	Brown crystals with a slight, sulfur dioxide odor
Manganese	4739-96-5	.2 mg/m^3	5 mg/m^3 C.	Inhalation Ingestion	Parkinson's; asthenia, insomnia, mental confusion; metal fume fever, dry throat, cough, tight chest; dyspnea, rales, flu-like fever, low-back pain; vomiting; malaise; fatigue	Respiratory system, CNS, blood, kidneys	Metal: a lustrous, brittle, silvery solid
Nickel	7440-02-0	1 mg/m^3	1 mg/m^3	Inhalation Ingestion Contact	Hypersensitivity can cause allergic contact dermatitis, pulmonary asthma, and inflammatory reactions, potential carcinogen	Nasal cavities, lungs, skin	Metal: lustrous, silvery, odorless solid
PCP	87-86-5	.5 mg/m^3	.5 mg/m^3	Inhalation Ingestion Contact Absorption	Irritates eyes, nose, throat; sneezing, cough; weakness, sweat; headaches, dizziness; nausea, vomiting, dyspnea; chest pain; high fever; dermatitis	Eyes, skin, respiratory system, cardiovascular system, liver, kidneys, CNS	Colorless to white, crystalline solid with a benzene-like odor
TCE	79-01-6	50 ppm	50 ppm	Inhalation Ingestion Contact	Headaches; vertigo; visual disturbance; tremors; nausea; vomiting; eye irritation; dermatitis; fatigue; giddiness; potential carcinogen	Eyes, skin, respiratory system, heart, liver, CNS	Colorless liquid; BP: 189 F; IP: 9.45 ev; UEL: 10.5%; LEL: 8%

Note: Benz(a)anthracene, Benzo(b)fluoranthene and Dibenz(a,h)anthracene do not have established exposure limits.

The risk of exposure to safety hazards during most phases of this project is low to moderate. In addition to the AHAs, general work rules and other safety procedures are described in this section.

4.2.3 Heat Stress

Heat stress may be a significant health hazard during project activities which involve wearing personal protective equipment. The Foster Wheeler Environmental Corporation Temperature Extremes Programs (HS 4-6) will be followed during heat stress conditions. As stated in the Program, the SPM, SHSO and the PHSM will devise a site-specific program that will effectively control the hazards of heat stress.

4.2.4 Confined Space

Employees will not enter a confined space on this project.

4.3 Biological Hazards

During the course of the project, there is a potential for workers to come into contact with biological hazards such as animals, insects and plants.

4.3.1 Animals

During site operations, animals such as dogs, cats, raccoons, skunks, mice and snakes may be encountered. Workers shall use discretion and avoid all contact with animals. If these animals present a problem, efforts will be made to remove these animals from the site by contacting a licensed pest control technician. Workers shall be encouraged to use the buddy system to assess one another for tick exposure.

4.3.2 Insects

Insects, such as mosquitoes, ticks, bees and wasps may be present during certain times of the year. Workers will be offered repellents (DEET for Ticks) when working in areas where insects are expected to be present. If insects are prevalent, efforts will be made to remove them from the site by contacting a licensed pest control technician.

4.3.3 Plants

Plants such as poison ivy and poison oak may be prevalent at the site during certain times of the year. Workers will be cautioned to avoid these plants and to minimize contact with them. PPE may be worn by employees in order to reduce the potential for exposure. Pre-exposure topical lotions may be applied prophylactically.

5.0 ACTIVITY HAZARD ANALYSES

The Activity Hazard Analysis is a systematic way of identifying the potential health and safety hazards associated with major phases of work on the project and the methods to avoid, mitigate and control these hazards. The AHAs follow the guidance of the Foster Wheeler Environmental Corporate Program Manual HS 3-5. AHAs will be developed for all activities as necessary, prior to start-up. The AHAs will be used to train work crews in proper safety procedures during phase preparatory meetings.

AHAs are included in Appendix C of this SHSP. AHAs have been developed for the following tasks:

- Pre-Mobilization Sampling/Surveying
- Task Mobilization
- Strip Topsoil
- Excavation/Confirmatory Sampling
- Backfill/Topsoil/Hydroseed
- Decontaminating Spoons

6.0 PERSONAL PROTECTIVE EQUIPMENT

The personal protective equipment (PPE) detailed below represents the hazard analysis and PPE selection required by 29 CFR 1910.132. For the purposes of PPE selection, the PHSM and SHSO are considered competent persons. The signatures contained in the approval section of the SHSP constitutes certification of the hazard assessment. For activities not detailed below, the SHSO will conduct the hazard assessment and select the PPE using the form provided in Appendix D and shall certify the assessment by signing the form. PPE selection will be made in consultation with the PHSM. The task- specific level of PPE required for each task is described in the AHA found in Appendix C.
The following is a list of PPE required for each level of work.

Level D PPE includes the following:

- Work clothes (shirts and pants)
- Gloves (as needed)
- Steel-toed boots
- Hard hat
- Eye protection
- Hearing protection (as needed)

Level D Modified PPE includes level D plus the following:

- Site dedicated coveralls or Tyvek
- Gloves (inner surgical type and outer nitrile)

Level C PPE includes Level D modified plus the following:

- Full face air-purifying respirator with combination organic vapor and high efficiency particulate air cartridge

Level B PPE includes Level C PPE and:

- Full face air-supplied respirator with Grade D air, combination escape bottle or SCBA.

Modifications for initial PPE selection may also be made by the SHSO in consultation with the PHSM. A written justification for downgrades will be provided to the PHSM for approval as a field change request form.

The initial level of PPE will be Level C PPE for **excavation of soil, debris and sludge and soil sampling.** The level of PPE may be down graded to Modified Level D depending upon air monitoring results and with the approval of the PHSM.

Pressure washing will be done in Level D Modified PPE.

7.0 AIR MONITORING

The following sections contain information describing the types, frequency and location of real time air monitoring and integrated air monitoring.

7.1 Real-Time Air Monitoring

7.1.1 Work Area Air Monitoring

This section addresses the real time air monitoring that will be conducted including instrumentation selection, frequency and location of air sampling. Real-time air monitoring will be conducted during soil sampling and excavation activities. Table 7.1 provides real-time air monitoring action levels.

The following instruments will be used for real-time air monitoring:

- Photo-Ionization Detector (PID) or Flame-Ionization Detector (FID)
- Combustible Gas Indicator (CGI)
- miniRAM (dust meter)

Monitoring will be performed by the SHSO every 30-60 minutes during soil sampling and excavation activities. A calibrated FID or PID organic vapor analyzer will be utilized to monitor the employee's breathing zone, and the soil samples after retrieval. The CGI will be used to monitor excavations and boreholes. A miniRAM will be used to conduct dust monitoring within the work zone or the employee's breathing zone.

7.1.2 Perimeter Air Monitoring

The following real-time instruments will be used for perimeter monitoring:

- Photo-Ionization Detector (PID) or Flame-Ionization Detector (FID)
- miniRAM (dust meter)

The SHSO will periodically take readings downwind and from the perimeter of the work area to determine if there is a migration of contaminants off-site which might affect the public and the surrounding environment. These readings will be compared to background, and if greater than background, then work procedures will be reviewed.

7.2 Integrated Air Monitoring

Assessment and evaluation of field personnel exposures to airborne contaminants through integrated air monitoring shall be performed by the SHSO concurrent with activities which may generate the contaminants in excess of OSHA PELs. Refer to Table 7-2 for personal air sampling contaminants of concern.

TABLE 7.1 REAL TIME AIR MONITORING ACTION LEVELS

AIR MONITORING INSTRUMENT	MONITORING LOCATION	ACTION LEVEL	SITE ACTION	REASON
PID/FID	Breathing Zone, Samples	0.5 ppm to > 10 ppm above background	No action required.	VOCs and SVOCs are expected to be very low
PID/FID	Breathing Zone, Samples	10 ppm - 25 ppm	No action required	Concentrations are less than 1/2 the PEL for TCE
PID/FID	Breathing Zone, Samples	>25 ppm - 250 ppm	Upgrade to Level C respiratory protection; initiate vapor suppression control efforts	Potential VOC exposure
PID/FID	Breathing Zone, Samples	>250 ppm	Upgrade to Level B respiratory protection	Assumes a conservative protection factor for respirators
CGI	Excavation, Boreholes	LEL < 10%	Investigate possible causes, use caution during procedures	Increasing potential for ignition of vapors
CGI	Excavation, Boreholes	LEL > 10%	Stop work; withdraw from work area	Potential for ignition of vapors
Mini-Ram	Breathing Zone	> 2.5 mg/m^3 (total dust)	Upgrade to Level C and apply dust control measures to maintain dust levels below 2.5 mg/m^3	1/2 the action level for respirable dust; concentrations of metals in soil are very low

7.2.1 Work Area Air Monitoring

Table 7.2 summarizes the integrated air monitoring which will be conducted. Air samples will be collected within the exclusion zone and along the site perimeter. Monitoring will be performed to determine the level of respiratory protection within the exclusion zone and to document that off-site migration of contaminants will not occur. Sampling media includes a three-piece filter cassette, tygon tubing and a pump at 2 liters per minute (1 pm) for eight hours. The sampling and analytical protocol will be consistent with NIOSH methods.

Monitoring will continue at the same frequency listed in Table 7.2 if the results are 75% or greater of the PEL. Engineering and administrative controls will also be implemented at this time to reduce exposure. Monitoring will discontinue if the results are less than 75% of the PEL and the real-time air monitoring is less than 2.5 mg/m^3. If real-time air monitoring is 2.5 mg/m^3 or greater, continue monitoring and implement engineering controls. Monitoring will continue and engineering controls implemented if real-time monitoring is 2.5 or greater.

Procedures to be followed include:

- Selection of high-risk individuals who may be subject to contaminant exposure, based on job assignment and observations of the SHSO.
- Air sampling pumps used to collect worker exposure samples shall be calibrated before and after use each day. Calibration shall be accomplished using a primary standard calibration system, e.g., the bubble tube method. Results of the calibrations shall be included in the health and safety field logbook and calibration logs.
- Chemical analysis of samples collected for assessment of employee exposures shall be performed only by analytical laboratories accredited by the American Industrial Hygiene Association.

7.2.2 Perimeter Air Monitoring

Site perimeter air monitoring samples will be collected three times a week for four weeks from four sampling locations and one co-location. Samples will be analyzed for metals on a 24-hour turnaround period for the first week and one week turnaround period for the second to fourth weeks. Blanks will be collected at a rate of one per every ten environmental samples.

7.3 Data Quality Assurance

7.3.1 Calibration

Instrument calibration shall be documented and included in a dedicated safety and health log book or on separate calibration pages. All instruments shall be calibrated before and after each shift.

Table 7.2 Frequency and Location of Integrated Air Monitoring

LOCATION OR ACTIVITY	CONTAMINANT	FREQUENCY
Exclusion zone during drilling and excavation operations	Beryllium and cadmium	Once per shift for first two weeks. Once per week after first two weeks.
Operators of drill rig and excavators and any other high risk individuals subject to contaminant exposure	Beryllium and cadmium	Three times a week for three weeks
Perimeter - four locations and one co-location	Beryllium and cadmium	Once per shift, for four weeks. Blanks will be collected at a rate of one per every ten environmental samples

Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

7.3.2 Operations

All instruments shall be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment will be maintained on-site by the SHSO for reference.

7.3.3 Data Review

The SHSO will interpret monitoring data based upon Table 7.1 and his/her professional judgement. The data will be reviewed and evaluated to determine the potential for worker exposure, upgrade/downgrades in levels of protection, comparison to direct reading instrumentation and changes in the integrated air monitoring strategy. The SHSO will immediately report all integrated sampling results at or above 75% of the PEL/TLV (one half of PEL/TLV where no respirators are worn) to the PHSM. Periodically, personnel exposure results will be tabulated and posted at the site.

8.0 ZONES, PROTECTION AND COMMUNICATION

8.1 Site Control

Site zones are intended to control the potential spread of contamination throughout the site and to assure that only authorized individuals are permitted into potentially hazardous areas. A three-zone approach will be utilized. It shall include an Exclusion zone (EZ), Contamination Reduction zone (CRZ) and a Support Zone (SZ). Specific zones shall be established on the work site when operations begin. An Exclusion Zone sign-in log shall be utilized daily.

This project is a hazardous waste remediation project, and any person working in an area where the potential for exposure to site contaminants exist, will be allowed access only after providing the SHSO with proper training and medical documentation.

Support Zone - The SZ is an uncontaminated area (trailers, offices, etc.) that will be the field support area for most operations. The SZ provides for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples.

Contamination Reduction Zone - The CRZ is established between the EZ and the SZ. The CRZ contains the contamination reduction corridor and provides for an area for decontamination of personnel and portable hand-held equipment, tools and heavy equipment. A personnel decontamination area will be prepared at each exclusion zone. The CRZ will be used for Exclusion Zone entry and egress in addition to access for heavy equipment and emergency support services.

Exclusion Zone - All activities which may involve exposure to site contaminants, hazardous materials and/or conditions should be considered an exclusion zone (EZ). This zone will be clearly delineated by cones, tapes or other means. The SHSO may establish more than one EZ where different levels of protection may be employed or different hazards exist. The size of the EZ shall be determined by the site SHSO allowing adequate space for the activity to be completed, field members and emergency equipment.

8.2 Contamination Control

Decontamination areas will be established for the following activities which involve potential contact with contaminated materials (drilling, excavating, stockpiling, sampling and deconning).

Personnel

- do not walk through areas of obvious or known contamination;
- do not handle or touch contaminated materials directly;
- make sure all personal protective equipment has no cuts or tears prior to donning;
- fasten all closures on suits, covering with tape, if necessary;
- particular care should be taken to protect any skin injuries;
- stay upwind of airborne contaminants; and
- do not carry cigarettes, gum, etc. into contaminated areas.

Sampling, Monitoring

- when required by the SHSO, cover instruments with clear plastic, leaving openings for sampling ports; and
- bag sample containers prior to emplacement of sample material.

Heavy Equipment

- limit the amount of contamination that comes in contact with heavy equipment;
- place a clean barrier between contaminated equipment and clean equpment to avoid cross contamination; and
- keep excavated soils contained and out of the way of workers.

8.2.1 Personnel Decontamination Station

Personnel exiting the Exclusion Zone shall be thoroughly decontaminated. Discarded protective clothing will be disposed in plastic bags. Specific decontamination procedures will be utilized as appropriate, depending on the level of operation performed by the individual. Safety briefings shall explain these decontamination procedures for personnel. The level of contamination at this site is expected to be moderate to low.

The following protocol shall be used for the decontamination stations according to levels of protection:

Level D	Level D+	Level C	Level B
1. Equipment drop	1. Equipment drop	1. Equipment drop	1. Equipment drop
2. Hand/Face wash	2. Outer boot & glove wash	2. Outer boot & glove wash	2. Outer boot & glove wash
	3. Outer boot & glove rinse	3. Outer boot & glove rinse	3. Outer boot & glove rinse
	4. Tape removal - boot & glove	4. Tape removal - boot & glove	4. Tape removal - boot & glove
	5. Outer boot & glove removal	5. Outer boot & glove removal	5. Outer boot & glove removal
	6. Coverall removal/disposal	6. Coverall removal/ disposal	6. SCBA or escape tank removal
	7. Inner glove removal/ disposal	7. Respirator removal	7. Coverall removal/ disposal
	8. Hand/face wash	8. Inner glove removal/disposal	8. SCBA or ALR face shield removal

Level D	Level D+	Level C	Level B
	9. Shower may be required	9. Inner clothing removal	9. Inner glove removal/ disposal
		10. Hand/face wash	10. Inner clothing removal
		11. Shower may be required	11. Hand/face wash
		12. Redress	12. Shower may be required
		13. Respirator cleaning/ sanitizing	13. Redress
			14. Respiratory cleaning/ sanitizing

Note: Not all of the decontamination stations will be needed; this depends upon equipment worn.

Note: At a minimum, all personnel will thoroughly wash their arms, face and hands upon exiting the EZ or CRZ prior to eating, drinking, smoking, applying cosmetics, or any other actions that would increase the risk of hand to mouth transfer of chemicals.

The following decontamination equipment is required for level D+ and higher protection levels:

Four small tubs (two sets of wash and rinse water), scrub brush, towels, contaminated clothing disposal bag or drum, and, respiratory cleaning solution.

Non-phosphate detergent (i.e., Dove) and water should be sufficient for use as the decontamination solution. All receptacles for contaminated protective clothing will be equipped with lids that can be closed to prevent the release of contaminants and the collection of rainfall. The decontamination liquids and clothing will be contained and disposed according to federal, state and local regulations.

8.2.2 Heavy Equipment Decontamination

Heavy equipment will not be permitted to leave the EZ unless it has been thoroughly decontaminated and visually inspected by the SHSO or his designee. This inspection will be documented on the form found in Appendix E. Heavy equipment will be decontaminated with a steam cleaner until no signs of visible contamination remain.

8.3 Communication

- Hand-held two-way radios are utilized as appropriate by field teams for communication with the Command Post
- Telephones - A telephone will be located on-site and at the Command Post for communication with emergency support services/facilities
- Hand Signals - Hand signals shall be used by field teams along with the buddy system. They shall be known by the entire field team before operations commence and their use covered during site-specific training. Typical hand signals are the following:

SIGNAL	MEANING
Hand gripping throat	Out of air, can't breathe
Grip on a partner's wrist or placement of both hands around a partner's waist.	Leave the area immediately, no debate.
Hands on top of head	Need assistance
Thumbs up	Okay, I'm all right, I understand.
Thumbs down	No, negative.

- Air horns shall be carried by field teams or be strategically located with the EZ and shall be maintained as the means for announcing emergency evacuation procedures and backup for other forms of communication.

9.0 MEDICAL SURVEILLANCE PROCEDURES

All contractor and subcontractor personnel performing field work where potential exposure to contaminants exist at the site are required to have passed a medical surveillance examination in accordance with 29 CFR 1910.120(f).

The Foster Wheeler Environmental Corporate Medical Surveillance Program is described in detail in Section 4.5 of the Health and Safety Program Manual. The Corporate Medical Consultant is Greaney Medical Group in California. Dr. Peter Greaney is Board certified in occupational medicine.

9.1 Medical Surveillance Requirements

A physician's medical release for work will be confirmed by the SHSO before an employee can work in the exclusion zone. The examination will be taken annually at a minimum and upon termination of hazardous waste site work if the last examination was not taken within the previous six months. Additional medical testing may be required by the PHSM in consultation with the Corporate Medical Consultant and the SHSO if an over-exposure or accident occurs, if an employee exhibits symptoms of exposure, or if other site conditions warrant further medical surveillance.

9.2 Medical Data Sheet

A medical data sheet is provided in Appendix F. This medical data sheet is voluntary and should be completed by all on-site personnel and will be maintained at the site. Where possible, this medical data sheet will accompany the personnel needing medical assistance. The medical data sheet will be maintained in a secure location, treated as confidential, and used only on a need-to-know basis.

10.0 SAFETY CONSIDERATIONS

10.1 General Health and Safety Work Rules

A list of work rules and general safe work practices has been included in the Foster Wheeler Environmental Health and Safety Program Manual, Section 3-6. These rules have been incorporated into the SHSP as Appendix G. The work rules will be posted in a conspicuous location at the site.

10.2 General Construction Hazards

The following is a list of applicable safety considerations for the major tasks. Further information is provided in the Activity Hazard Analysis and the Foster Wheeler Environmental Health and Safety Program Manual.

- Heavy Equipment (bucket loader, excavator and drill rig)
- Fire Hazards
- Slips/Trips/Falls
- Lifting/Materials Handling

11.0 WASTE DISPOSAL PROCEDURES

All discarded materials, waste materials or other objects shall be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard or causing litter to be left on site. All potentially contaminated materials, e.g., clothing, gloves, etc., will be bagged or drummed as necessary, labeled and segregated for disposal according to state and federal regulations. All non-contaminated materials shall be collected and bagged for appropriate disposal as non-hazardous solid waste.

12.0 EMERGENCY RESPONSE PLAN

This section establishes procedures and provides information for use during a project emergency. Emergencies sometimes happen unexpectedly and quickly, and require an immediate response; therefore, contingency planning and advanced training of staff are essential. Specific elements of emergency support procedures which are addressed in the following subsections include communications, local emergency support units, preparation for medical emergencies, first aid for injuries incurred on site, record keeping, and emergency site evacuation procedures.

12.1 Responsibilities

12.1.1 Project Health and Safety Manager (PHSM)

The PHSM is Grey Coppi.
The PHSM oversees and approves the Emergency Response/Contingency Plan and performs audits to determine that the plan is in effect and that all pre-emergency requirements are met. The PHSM acts as a liaison to applicable regulatory agencies and notifies OSHA of reportable accidents.

12.1.2 Site Health and Safety Officer (SHSO)

The SHSO is to be determined.
The SHSO is responsible for ensuring that all personnel are evacuated safely and that machinery and processes are shut down or stabilized in the event of a stop work order or evacuation. The SHSO is required to immediately notify the PHSM of any fatalities or catastrophes (three or more workers injured and hospitalized) so that the PHSM can notify OSHA within the required time frame. The PHSM will be notified of all OSHA recordable injuries, fires, spills, releases or equipment damage in excess of $500 within 24 hours. The SHSO also serves as the Alternate Emergency Coordinator.

12.1.3 Emergency Coordinator

The Emergency Coordinator is the **project superintendent.**
The Emergency Coordinator shall make contact with Local Emergency Response personnel prior to beginning work on site. In these contacts the emergency coordinator will inform interested parties about the nature and duration of work expected on the site and the type of contaminants and possible health or safety effects of emergencies involving these contaminants. The emergency coordinator shall locate emergency phone numbers and identify hospital routes prior to beginning work on site. The emergency coordinator shall make necessary arrangements to be prepared for any emergencies that could occur.

The Emergency Coordinator shall implement the Emergency Response/Contingency Plan whenever conditions at the site warrant such action.

12.1.4 Site Personnel

Site personnel are responsible for knowing the Emergency Response/Contingency Plan and the procedures contained herein. Personnel are expected to notify the Emergency Coordinator of situations that could constitute a site emergency.

12.2 Local Emergency Support Units

Table 12.1 contains emergency numbers which will be posted prominently in the field office (Command Post) and field vehicles.

Figure 12.1 is a map showing the route to the nearest hospital. The map will be posted adjacent to the above emergency telephone numbers in the field office and field vehicles. Warminster General Hospital will be used for emergencies and is located at 225 Newtown Road, Warminster, PA.

12.3 Pre-emergency Planning

Foster Wheeler Environmental will communicate directly with administrative personnel from the emergency room at the hospital in order to determine whether the hospital has the facilities and personnel needed to treat cases of trauma resulting from exposure to any of the contaminants expected to be found on the site.

12.4 Emergency Medical Treatment

The procedures and rules in this SHSP are designed to prevent employee injury. However, should an injury occur, no matter how slight, it will be reported to the SHSO immediately.
During the site safety briefing, project personnel will be informed of the location of the first aid station(s) that has been set up. Unless they are in immediate danger, severely injured persons will not be moved until paramedics can attend to them. Some injuries, such as severe cuts and lacerations or burns, may require immediate treatment. Any first aid instructions that can be obtained from doctors or paramedics, before an emergency-response squad arrives at the site or before the injured person can be transported to the hospital, will be followed closely.

Only in **non-emergency** situations will an injured person be transported to the hospital by means other than an ambulance.

12.5 Emergency Site Evacuation Routes and Procedures

In the event of a fire or explosion, procedures will include immediately evacuating the site (air horn will sound for a single continuous blast), and notification of local fire and police departments. No personnel will fight a fire beyond the stage where it can be put out with a portable extinguisher (incipient stage).

In order to mobilize the manpower resources and equipment necessary to cope with a fire or other emergency, a clear chain of authority will be established. The EC will take charge of all emergency

TABLE 12.1 EMERGENCY TELEPHONE NUMBERS

Contact	Firm or Agency	Telephone Number
Police	Local	215-674-3333
Fire	Local	215-672-1000
Hospital	Warminster General Hospital	215-441-6000 ER-215-441-6775
Paula Michaud	Navy ROICC	215-441-3201
EPA Region Branch Response Center	Federal	215-597-9800
PHSM, Grey Coppi	Foster Wheeler Environmental	215-702-4079
SHSO, TBD	Foster Wheeler Environmental	TBD
Poison Control Center		215-386-2100
Chemtrec		800-424-9300
National Response Center		800-424-8802
DO Manager-Ed Leonard	Foster Wheeler Environmental	215-702-4074
Regulatory Affairs-Tom Teeling	Foster Wheeler Environmental	215-702-4078
LEPC	John Dougherty Bucks Co. Emergency Management Agency	215-348-7518
Base Security		441-2097
NOSC	Fire Chief	441-3333

Warminster Hospital
225 Newtown Road
Warminster, PA

Emergency Services: 215- 441-6775

Directions:

From eastern portion of the site (Airfield) exit to Jacksonville Road (Route 332) and turn Right heading northeast to first traffic light (Street Road). At the Street Road Intersection make a Left.

From western portion of the site exit to Jacksonville Road (Route 332) and turn Left heading northeast to first traffic light (Street Road). At the Street Road Intersection make a Left.

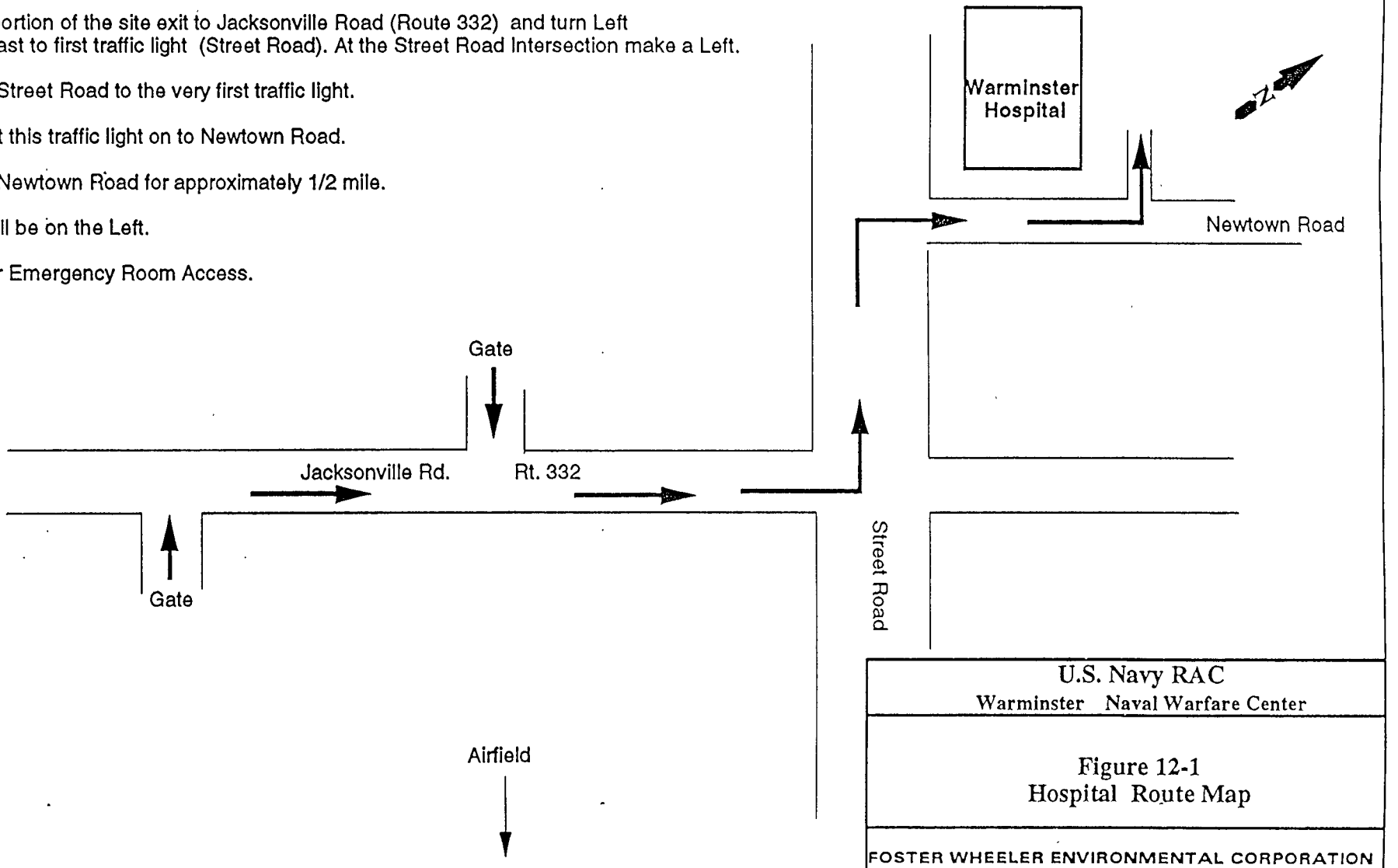
Proceed down Street Road to the very first traffic light.

Make a Right at this traffic light on to Newtown Road.

Proceed down Newtown Road for approximately 1/2 mile.

The Hospital will be on the Left.

Follow signs for Emergency Room Access.



U.S. Navy RAC
Warminster Naval Warfare Center

Figure 12-1
Hospital Route Map

FOSTER WHEELER ENVIRONMENTAL CORPORATION

action activities and dictate the procedures that will be followed for the duration of the emergency. The EC will report immediately to the scene of the emergency, assess the seriousness of the situation, and direct whatever efforts are necessary until the emergency response units arrive. At his discretion, the EC also may order the closure of the site for an indefinite period.

All project personnel will be instructed on proper emergency action procedures and locations of emergency telephone numbers during the initial site safety meeting. If an emergency occurs, including but not limited to fire, explosion or significant release of toxic gas into the atmosphere, an air horn will be sounded on the site. The horn will sound continuously for one blast, signaling that immediate evacuation of all personnel is necessary due to an immediate or impending danger.

The EC will give directions for implementing whatever actions are necessary. Any project team member may be assigned to be in charge of emergency communications during and emergency. He will attend the site telephone specified by the EC from the time the alarm sounds until the emergency has ended.

After sounding the alarm and initiating emergency response procedures, the EC will check and verify that access roads are not obstructed. If traffic control is necessary, as in the event of a fire or explosion, a project team member, who has been trained in these procedures and designated at the site safety meeting, will take over these duties until local police and fire fighters arrive.

The EC will remain at the site to provide assistance requested by emergency-response squads as they arrive to deal with the situation.

12.5.1 Evacuation Drills

The drills will simulate situations that may be likely to occur onsite. A critique of the drill according to Foster Wheeler Environmental Health and Safety Program Manual HS 2-1 will be conducted.

12.6 Fire Prevention and Protection

12.6.1 Fire Prevention

Fires will be prevented by adhering to the following precautions:

- Good housekeeping and storage of materials;
- Storage of flammable liquids and gases away from oxidizers;
- Shutting off engines to refuel;
- Grounding and bonding metal containers during transfer of flammable liquids;
- Use of UL approved flammable liquid storage containers;
- Fire extinguishers rated at least 10 pounds ABC located on all heavy equipment, in all trailers and near all hot work activities;
- Monthly inspections of all fire extinguishers; and
- Perform air monitoring for combustibles.

12.7 Overt Chemical Exposure

The following are standard procedures to treat chemical exposures. Other, specific procedures detailed on the Material Safety Data Sheet or recommended by the Corporate Medical Consultant will be followed, when necessary.

SKIN AND EYE CONTACT: Use copious amounts of soap and water. Wash/rinse affected areas thoroughly, then provide appropriate medical attention. Eyes should be rinsed for 15 minutes upon chemical contamination. Skin should also be rinsed for 15 minutes if contact with caustics, acids or hydrogen peroxide occurs.

INHALATION: Move to fresh air. Decontaminate and transport to hospital or local medical provider.

INGESTION: Decontaminate and transport to emergency medical facility.

PUNCTURE WOUND OR LACERATION: Decontaminate and transport to emergency medical facility.

12.8 Decontamination During Medical Emergencies

If emergency life-saving first aid and/or medical treatment is required, normal decontamination procedures may need to be abbreviated or postponed at the site. The SHSO or designee will accompany contaminated victims to the medical facility to advise on matters involving decontamination, when necessary. The outer garments can be removed at the site if this does not cause delays, interfere with treatment or aggravate the problem. Respiratory equipment must always be removed at the site. Protective clothing can be cut away. If the outer contaminated

garments cannot be safely removed on-site, a plastic barrier placed between the injured individual and clean surfaces should be used to help prevent contamination of the inside of ambulances and/or medical personnel. Outer garments may be removed at the medical facility. No attempt will be made to wash or rinse the victim if his/her injuries are life threatening, unless it is known that the individual has been contaminated with an extremely toxic or corrosive material which could also cause severe injury or loss of life to emergency response personnel. For minor medical problems or injuries, the standard decontamination procedures will be followed.

12.9 Accident/Incident Reporting

As soon as first aid and/or emergency response needs have been met, the following parties are to be contacted by telephone:

- Project Health and Safety Manager
- Project Manager
- The employer of any injured worker who is not a Foster Wheeler Environmental employee.

Written confirmation of verbal reports are to be submitted within 24 hours. The accident/incident report is found in the Foster Wheeler Environmental Corporate Health and Safety Program Manual Section HS 1-7. If the employee involved is not a Foster Wheeler Environmental employee, his employer shall receive a copy of the report.

12.10 Adverse Weather Conditions

In the event of adverse weather conditions, the SHSO or designee will determine if work can continue without potentially risking the safety of all field workers. Some of the items to be considered prior to determining if work should continue are:

- Potential for heat stress and heat-related injuries;
- Potential for cold stress and cold-related injuries;
- Treacherous weather-related working conditions (hail, rain, snow, ice, high winds);
- Limited visibility (fog);
- Potential for electrical storms;
- Earthquakes; and,
- Other major incidents.

Site activities will be limited to daylight hours, or when suitable artificial light is provided, and acceptable weather conditions prevail. The SHSO will determine the need to cease field operations or observe daily weather reports and evacuate, if necessary, in case of severe inclement weather conditions.

12.11 Spill Control and Response

All small hazardous spills/environmental releases shall be contained as close to the source as possible. Whenever possible, the MSDS will be consulted to assist in determining the best means

of containment and cleanup. For small spills, sorbent materials such as sand, sawdust or commercial sorbents should be placed directly on the substance to contain the spill and aid recovery. Any acid spills should be diluted or neutralized carefully prior to attempting recovery. Berms of earthen or sorbent materials can be used to contain the leading edge of the spills. Drains or drainage areas should be blocked. All spill containment materials will be properly disposed as hazardous waste. An exclusion zone of 50-100 feet around the spill area should be established depending on the size of the spill.

The following steps should be taken by the Emergency Coordinator:

- Determine the nature, identity and amounts of major spill components;
- Make sure all unnecessary persons are removed from the spill area;
- Notify appropriate response teams and authorities;
- Use proper PPE in consultation with the SHSO;
- If a flammable liquid, gas or vapor is involved, remove all ignition sources and use nonsparking and/or explosive proof equipment to contain or clean up the spill (diesel only vehicles, air operated pumps, etc.);
- If possible, try to stop the leak with appropriate material; and,
- Remove all surrounding materials that can react or compound with the spill.
- Notify Langhorne, Pa, Regulatory Affairs Advisor- Mr. Tom Teeling at 215-702-7078

Foster Wheeler personnel only respond in a defensive manner to on-site chemical spills. The methods and measures taken by FW personnel are based upon the anticipated field scenarios and on skill and knowledge level of employees. Training on-site of specific procedures will be provided by SHSO.

12.12 Emergency Equipment

The following minimum emergency equipment shall be kept and maintained on-site.

- Industrial first aid kit;
- Portable eye washes (one per field team) meeting ANSI Z.358.1-1991;
- Air horns (one per field team);
- Fire extinguishers (one per trailer/vehicle, trailers and located at hot work stations);
- Fire Blanket
- Absorbent Material

12.13 Restoration and Salvage

After an emergency, prompt restoration of utilities, fire protection equipment, medical supplies and other equipment will reduce the possibility of further losses. Some of the items that may need to be addressed are:

- Refilling fire extinguishers;
- Refilling medical supplies;
- Recharging eyewashes and/or showers;
- Replenishing spill control supplies; and,
- Replacing used air horns

13.0 TRAINING

13.1 General Health and Safety Training

In accordance with Foster Wheeler Environmental corporate policy, and pursuant to 29 CFR 1910.120, hazardous waste site workers shall, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations unless otherwise noted in the above reference. At a minimum, the training shall have consisted of instruction in the topics outlined in the standard. Personnel who have not met the requirements for initial training shall not be allowed to work in any site activities in which they may be exposed to hazards (chemical or physical).

13.1.1 Three Day Supervised On the Job Training

In addition to the required initial hazardous waste operations training, each employee shall have received three days of directly supervised on-the-job training. This training will address the duties the employees are expected to perform.

13.2 Annual Eight-Hour Refresher Training

Annual eight-hour refresher training will be required of all hazardous waste site field personnel in order to maintain their qualifications for field work. The training will cover a review of 1910.120 requirements and related company programs and procedures

13.3 Supervisory Training

Foster Wheeler Environmental personnel have received an eight-hour class for supervisors per OSHA 1910.120(e).

13.4 Site-Specific Training

Prior to commencement of field activities, all field personnel assigned to the project will have completed training that will specifically address the activities, procedures, monitoring, and equipment used in the site operations. It will include site and facility layout, hazards and emergency services at the site and will highlight all provisions contained within this SHSP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

13.5 On-Site Safety Briefings

Project personnel and visitors will be given on-site health and safety briefings by the Project Superintendent to assist site personnel in safely conducting their work activities. The briefings will include information on new operations to be conducted, changes in work practices or changes in the site's environmental conditions, as well as periodic reinforcement of previously discussed topics. The briefings will also provide a forum to facilitate conformance with safety requirements and to

identify performance deficiencies related to safety during daily activities or as a result of safety inspections. The meetings will also be an opportunity for the SHSO to periodically update the employees on air monitoring results. Prior to starting any new activity, a training session using the Activity Hazard Analysis will be held for crew members involved in the activity.

13.6 First Aid and CPR

The SHSO will identify those individuals requiring first aid and CPR training in order to ensure that emergency medical treatment is available during field activities. It is expected that a minimum of one field person onsite will be certified in First Aid and CPR. The training will be consistent with the requirements of the American Red Cross Association. Foster Wheeler Environmental trained first aiders have received bloodborne pathogens training.

13.7 Hazard Communication

Hazard communication training will be provided in accordance with the requirements contained in the Foster Wheeler Environmental Health and Safety Program Manual, Section 4-2.

14.0 LOGS, REPORTS AND RECORDKEEPING

The following is a summary of required health and safety logs, reports and recordkeeping.

14.1 Field Change Request

To be completed for initiating a change to the SHSP. The PHSM and Project Manager or designee approval is required. The original will be kept in the project file. Approved changes will be reviewed with affected field personnel at a safety briefing. Copies will be distributed to the Client Representative.

14.2 Medical and Training Records

Copies or verification of training (40 hour, 8 hour, supervisor, site specific training and documentation of three day OJT) and medical clearance for hazardous waste site work and respirator use will be maintained onsite. Records for all subcontractor employees will also be kept onsite. All employee medical records will be maintained by the Corporate Medical Consultant - Greaney Medical Group in accordance with Foster Wheeler Environmental Corporation Health and Safety Program Manual, section HS 1-8.

14.3 On-site Log

A log of personnel on-site each day will be kept by FW.

14.4 Weekly Safety Reports

The SHSO shall complete and submit weekly safety reports to the PHSM. The report is provided in Appendix H.

14.5 Accident/Incident Reports

The incident reporting and investigation during site work will follow Foster Wheeler Environmental Corporation Health and Safety Program Manual, section HS 1-7.

14.6 OSHA Form 200

An OSHA Form 200 will be kept at the project site. All recordable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to the Regional Health and Safety Manager for maintenance. Subcontractor employers must also meet the requirements of maintaining an OSHA 200 form. The incident report form referenced in section 12.11 meets the requirements of the OSHA Form 101(supplemental record) and must be maintained with the OSHA Form 200 for all recordable injuries or illnesses.

14.7 Health and Safety Logbooks

The SHSO will maintain logbooks during site work. The daily site conditions, personnel, monitoring results and significant events will be recorded. The original logbooks will become part of the exposure records file.

14.8 Hazard Communication Program/MSDS

Material Safety Data Sheets (MSDS) will be obtained for applicable substances and included in the site hazard communication file. The hazard communication program will be maintained onsite in accordance with 29 CFR 1910.1200 and Foster Wheeler Environmental Corporation Health and Safety Program Manual Section HS 4-2.

15.0 FIELD PERSONNEL REVIEW

This form serves as documentation that field personnel have read, or have been informed of, and understand the provisions of the SHSP. It is maintained on site by the SHSO as a project record.

Each field team member shall sign this section after site-specific training is completed and before being permitted to work on site.

I have read, or have been informed of, the Site-Specific Health and Safety Plan and understand the information presented. I will comply with the provisions contained therein.

Name (Print and Sign)	*Date*

16.0 REFERENCES

American Conference of Governmental Industrial Hygienists, Inc., 1992, Documentation of the threshold limit values and biological exposure indices; 6th Ed., ACGIH, Cincinnati, Ohio.

American Conference of Governmental Industrial Hygienists, Inc., 1987, Guidelines for the selection of chemical protective clothing; Third Edition, ACGIH, Cincinnati, Ohio, February 1987.

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Sax, N. Irving, 1992, Dangerous properties of industrial materials, 8th Ed; Van Nostrand Reinhold Co. Inc., New York, NY.

U.S. Army Corps of Engineers, 1987, Safety and health requirements manual; EM 385-1-1, revised October 1992.

U.S. Department of Labor, Occupational Safety and Health Administration, 1989, 29 CFR Part 1910 Hazardou

U.S. Environmental Protection Agency, 1988, Standard operating safety guides; July, 1988.

U.S. Environmental Protection Agency, no date, Response safety decision-making; Course manual, Office of Emergency and Remedial Response, Hazardous Response Support Division.

APPENDIX A

FIELD CHANGE REQUEST FORM

HASP FIELD CHANGE

Field Change Number: _____ Date Effective: _____

Pen and Ink changes to be made in the HASP to alert the reader of this change:

Reason for the change to be incorporated into the HASP:

TEXT OF CHANGE TO BE INCORPORATED:

FOSTER WHEELER ENVIRONMENTAL
FIELD CHANGE REQUEST FORM

PROJECT:

CHARGE NUMBER:

PROJECT LOCATION:

DESCRIPTION OF CHANGE:

REASON FOR CHANGE:

RECOMMENDED DISPOSITION:

SITE MANAGER:

Signature Date

PROJECT SAFETY AND HEALTH MANAGER:

Signature Date

DISTRIBUTION:

Project Health and Safety Manager _____
Site Health and Safety Officer _____
Quality Assurance Representative _____
Field Operation Leader _____

FIELD CHANGE RECORDS

Record of Field Changes:

Initial for attaching any Field changes to this HASP. Enter the Field Change Number and Date Issued. File the completed field changes to this HASP at the end as attachments. Make PEN and INK changes in the text to alert the reader to the changes that are required in the Field Change.

FIELD CHANGE NUMBER	DATE ENTERED	SYNOPSIS OF CHANGE	INITIAL

APPENDIX B

ANALYTICAL RESULTS

PROPOSED REMOVAL ACT[redacted]OALS FOR SITE 4
NAWC WARMINSTER, PENNSYLVANIA

Analyte	Media of Concern	TBC (1)	Range of Detected Concentrations In On-Site Media (ppm)	Range of Detected Concentrations In Background (ppm)
Inorganics				
BARIUM	Surface Soil	1	24.75 - 116	37.3 - 113
BARIUM	Subsurface Soil	1	31.6 660	42 - 67.7
BERYLLIUM	Surface Soil	3	0.515 - 1.3	0.84 - 1.1
CADMIUM	Subsurface Soil	2	4.2	Not Detected
MANGANESE	Subsurface Soil	3	81.4 - 876	116 - 487
MANGANESE	Surface Soil	3	140 - 1090	132 - 573
NICKEL	Subsurface Soil	1	7.8 - 21.1	8.7 - 12.1
Volatiles				
TRICHLOROETHENE	Surface Soil	1	0.007 - 0.025	Not Analyzed
Semivolatiles				
PENTACHLOROPHENOL	Surface Soil	1	0.042	Not Detected
PENTACHLOROPHENOL	Subsurface Soil	1	0.061	Not Detected
BENZ(A)ANTHRACENE	Surface Soil	1	0.079 - 0.87	Not Detected
BENZ(A)ANTHRACENE	Subsurface Soil	1	0.045 - 1.1	Not Detected
BENZO(B)FLUORANTHENE	Surface Soil	3	0.058 - 1.1	Not Detected
BENZO(B)FLUORANTHENE	Subsurface Soil	3	0.055 - 1.5	Not Detected
BENZO(A)PYRENE	Surface Soil	3	0.046 - 0.7	Not Detected
BENZO(A)PYRENE	Subsurface Soil	3	0.045 - 1.005	Not Detected
DIBENZ(A,H)ANTHRACENE	Subsurface Soil	3	0.1 - 0.1015	Not Detected
Pesticides/PCBs				
DIELDRIN	Subsurface Soil	1	0.0054 - 0.022	Not Detected
ENDOSULFAN SULFATE	Subsurface Soil	2	0.88	Not Detected
AROCLOR-1248	Surface Soil	3	0.064 - 0.1395	Not Detected
AROCLOR-1248	Subsurface Soil	3	0.046 - 3.5	Not Detected
AROCLOR-1254	Subsurface Soil	3	0.51	Not Detected

Note: AWQC and ER-L are not specific removal action goals for Site 4. Rather the goals established for surface and subsurface soils will be protective of surface water and sediment if future migration of chemicals in soils to surface water/sediments occurs

(1) References:

1. EPA, 1994. Soil Screening Guidance.
2. EPA, 1993. Selected Exposure Routes and COCs by Risk-Based Screening Levels.
3. EPA, 1995. Risk-Based Concentration Table (January - June 1995).

(2) These are interim goals that may be modified during the removal design work based on more definitive guidance.

SOURCE: EECA, HNUS_ July 1995

APPENDIX C

ACTIVITY HAZARD ANALYSIS

ACTIVITY HAZARD ANALYSIS

Project: SITE 4 NAWC WARMINSTER
Location: WARMINSTER, PA
Activity: TASK 1 - PRE-MOBILIZATION SAMPLING/SURVEYING

MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
1. Mobilization of equipment and supplies (Hazards and Controls 1-8 apply)	1. Back Injuries	1. Lift work structures to 30-36 inches above ground; site personnel will be instructed on proper lifting techniques; Mechanical devices (wheel barrow) should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available; Instruct personnel on proper lifting techniques.
2. Survey trench layouts (Hazard and Control 2 applies)	2. Slips/Trips/Falls	2. Maintain work areas safe and orderly; unloading areas should be on even terrain; mark and repair if possible tripping hazards.
3. Conduct drilling and collection of soil samples (Hazards and Controls 1-14 apply)	3. Vehicular Traffic	3. Spotters will be used when backing up trucks, heavy equipment and moving equipment
4. Decontaminate drill rig and sampling equipment (Hazards and Controls 2, 6, 7, 10, 13, and 15 apply)	4. Overhead Hazards	4. Personnel will be required to wear hard hats that meet ANSI Standard Z89.1
	5. Dropped Objects	5. Steel toe boots meeting ANSI Standard Z41 will be worn
	6. Noise	6. Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs); SHSO will determine the need for hearing protection; all equipment will be equipped with manufacturer's required mufflers
	7. Eye Injuries	7. Safety glasses meeting ANSI Standard Z87 will be worn during drilling and sampling operations; Pressure washing requires chemical goggles and a full-faced shield
	8. Heavy Equipment (rollovers, overhead hazards, spills, struck by or against)	8. Equipment will have rollover protective structures and seat belts; operators shall wear seat belts when operating equipment; do not operate equipment on grades which exceed manufacturer's recommendations; equipment will have guards, canopies or grills to protect from flying objects; ground personnel will stay clear of all suspended loads; all slings chains and ropes will be rated for the load in which it is expected to lift; spills and absorbent materials will be readily available; drip pans, polyethylene sheeting or other means will be used for secondary containment; eye contact with operators will be made before approaching equipment; equipment will not be approached on blind sides; avoid equipment swing areas; know hand signals; all equipment will be equipped with backup alarms
	9. Fire	9. ABC type fire extinguishers shall be readily available; No smoking in work area
	10. Chemical Exposure to metals/VOs Chemical Exposure to alcohol and/or hexane	10. Protective clothing (i.e., Level C PPE: Tyvek, chemical gloves and chemical resistant boots) will be worn during drilling and sampling operations; skin will be rinsed with water if contact with hazardous material occurs; a portable eye wash station will be located by work area; Pressure washing requires the use of chemical goggles, tyvek and full-faced shield; perform PID air monitoring for decon chemicals, consult with PHSM if any readings greater than 5 ppm.
	11. Spills	11. Spill and absorbent materials will be readily available
	12. Underground Hazards	12. All underground utilities will be identified prior to drilling and excavation; dig safe number(s) will be logged and documented

Project: SITE 4 NAWC WARMINSTER
Activity: TASK 1 - PRE-MOBILIZATION SAMPLING/SURVEYING

Location: WARMINSTER, PA

MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
	13. Inhalation Exposure to metals/VOs Chemical Exposure to alcohol and/or hexane	13. Drilling activities will be conducted in Level C respiratory protection; Air monitoring will be performed as required by SHSP
	14. Pinch/Cut/Smash	14. Cut resistant work gloves will be worn when dealing with sharp objects; all hand and power tools will be maintained in safe condition; guards will be kept in place while using hand and power tools
	15. Struck by (pressurized water stream)	15. Proper instruction of safe use of pressure washers will be conducted; ;operators will not fix the hand trigger in the open position such that if the wand were left unattended, water would spray from the tip; all pressure washers will be equipped with a deadman switch.
	16. Heat Stress	16. Provide work/rest breaks; provide shading from radiant heat; provide and encourage workers to drink fluids; perform tasks early in day, if possible; institute FW heat stress prevention program; only wear tyvec where required by hazard, to be evaluated by SHSO.
	17. Repetitive trauma injury during deconning spoons	17. Use lab-type squirt bottles, not trigger sprayers, to decon spoons; rotate job assignments; lift work surfaces to 30-36 inches aboveground

EQUIPMENT USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
1. Drill Rig 2. Level C and Modified Level D PPE 3. First Aid Kits 4. Portable Eyewash 5. Fire Extinguishers 6. Pressure Washer 7. Monitoring Equipment (CGI, PID/FID, miniRAM)	1. Monthly inspections will be performed on fire extinguishers. 2. Daily safety and weekly inspections will be performed on first aid kits. 3. Portable eye wash will be inspected monthly. 4. Pressure washers will be inspected prior to each use. 5. Drill rig will be inspected prior to each use. 6. Monitoring equipment will be calibrated daily (Pre and Post)	1. Personnel have read and comply with SHSP 2. Site specific training 3. Qualified operators will be used for drill rig operation 4. Instruct personnel on proper use of fire extinguishers 5. At least 2 individuals on-site will have current CPR and First aid training

ACTIVITY HAZARD ANALYSIS

Project: SITE 4 NAWC WARMINSTER
Activity: TASK 2 - MOBILIZATION

Location: WARMINSTER, PA

MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
1. Preparation of work area. (Hazards and Controls 1-3 apply)	1. Back Injuries	1. Site personnel will be instructed on proper lifting techniques; Mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available; Instruct personnel on proper lifting techniques.
2. Transportation of equipment and delivery of materials (Hazards and Controls 1-5 apply)	2. Slips/Trips/Falls	2. Maintain work areas safe and orderly; unloading areas should be on even terrain; mark and repair if possible tripping hazards.
3. Construction of decontamination pad (Hazards and Controls 1-8 apply)	3. Pinch/Cut/Smash	3. Cut resistant work gloves will be worn when dealing with sharp objects; all hand and power tools will be maintained in safe condition; guards will be kept in place while using hand and power tools
4. Construction of a clean gravel road (Hazards and Controls 1-8 apply)	4. Vehicular Traffic	4. Spotters will be used when backing up trucks and moving equipment
5. Construction of stockpile areas (Hazards and Controls 1-8 apply)	5. Heavy Equipment (rollovers, overhead hazards, spills, struck by or against)	5. Equipment will have rollover protective structures and seat belts; operators shall wear seat belts when operating equipment; do not operate equipment on grades which exceed manufacturer's recommendations; equipment will have guards, canopies or grills to protect from flying objects; ground personnel will stay clear of all suspended loads; all slings chains and ropes will be rated for the load in which it is expected to lift; spills and absorbent materials will be readily available; drip pans, polyethylene sheeting or other means will be used for secondary containment; eye contact with operators will be made before approaching equipment; equipment will not be approached on blind sides; avoid equipment swing areas; know hand signals; all equipment will be equipped with backup alarms
6. Installation of temporary site support facilities (Hazards and Controls 1-3 and 5-8 apply)	6. Noise	6. Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs); SHSO will determine the need for hearing protection; all equipment will be equipped with manufacturer's required mufflers
	7. Electrocution	7. Ground fault circuit interrupters will be used; cords will be kept off and out of wet areas unless they are approved submersible type; cords will be inspected prior to use; damaged equipment will be tagged and taken out of service
	8. Fire	8. Smoking will not be allowed in work area; 10-lb. ABC type fire extinguishers shall be readily available

EQUIPMENT USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
1. Hand and Power Tools 2. Level D PPE 3. First Aid Kits 4. GFCIs and Extension Cords 5. Portable Eyewash 6. Fire Extinguishers 7. Heavy Equipment	1. Initial inspections will be required prior to use of hand and power tools. 2. Monthly inspections will be performed on fire extinguishers. 3. Daily safety and weekly inspections will be performed on first aid kits. 4. Extension cords will be inspected prior to each use. 5. Heavy equipment will be inspected prior to each use. 6. Portable eye wash will be inspected monthly. 7. GFCIs will be inspected monthly	1. Personnel have read and comply with SHSP 2. Site specific training 3. Qualified operators will be used for heavy equipment operation 4. Instruct personnel on proper use of fire extinguishers 5. At least 2 individuals on-site will have current CPR and First aid training 6. Personnel will be trained to use power tools safely 7. Personnel will be trained on proper use of extension cords

ACTIVITY HAZARD ANALYSIS

Project: SITE 4 NAWC WARMINSTER
Activity: TASK 3 - STRIP TOPSOIL

Location: WARMINSTER, PA

MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
1. Mobilization of equipment and supplies (Hazards and Controls 1-8 apply)	1. Back Injuries	1. Site personnel will be instructed on proper lifting techniques; Mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available; Instruct personnel on proper lifting techniques.
2 Strip and stock pile topsoil (Hazards and Controls 1-13 apply)	2. Slips/Trips/Falls	2. Maintain work areas safe and orderly; unloading areas should be on even terrain; mark and repair if possible tripping hazards.
	3. Vehicular Traffic	3. Spotters will be used when backing up trucks, heavy equipment and moving equipment
	4. Overhead Hazards	4. Personnel will be required to wear hard hats that meet ANSI Standard Z89.1
	5. Dropped Objects	5. Steel toe boots meeting ANSI Standard Z41 will be worn
	6. Noise	6. Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs); SHSO will determine the need for hearing protection; all equipment will be equipped with manufacturer's required mufflers
	7. Eye Injuries	7. Safety glasses meeting ANSI Standard Z87 will be worn during removal of topsoil
	8. Heavy Equipment (rollovers, overhead hazards, spills, struck by or against)	8. Equipment will have rollover protective structures and seat belts; operators shall wear seat belts when operating equipment; do not operate equipment on grades which exceed manufacturer's recommendations; equipment will have guards, canopies or grills to protect from flying objects; ground personnel will stay clear of all suspended loads; all slings chains and ropes will be rated for the load in which it is expected to lift; spills and absorbent materials will be readily available; drip pans, polyethylene sheeting or other means will be used for secondary containment; eye contact with operators will be made before approaching equipment; equipment will not be approached on blind sides; avoid equipment swing areas; know hand signals; all equipment will be equipped with backup alarms
	9. Fire	9. ABC type fire extinguishers shall be readily available; No smoking in work area
	10. Chemical Exposure to metals, VOs	10. Topsoil removal operations will require Mod Level D PPE
	11. Spills	11. Spill and absorbent materials will be readily available
	12. Underground Hazards	12. All underground utilities will be identified prior to excavation; dig safe number(s) will be logged and documented
	13. Inhalation Exposure to metals, VOs	13. Topsoil removal activities will be conducted in Mod Level D PPE

Project: SITE 4 NAWC WARMINSTER
Activity: TASK 3 - STRIP TOPSOIL

Location: WARMINSTER, PA

	14. Heat Stress	14. Provide work/rest breaks; provide shading from radiant heat; provide and encourage workers to drink fluids; perform tasks early in day, if possible; institute FW heat stress prevention program; only wear tyvec where required by hazard to be evaluated by SHSO.
EQUIPMENT USED	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
1 Backhoe/Front-end Loader 2. Level D PPE 3. First Aid Kits 4. Portable Eyewash 5. Fire Extinguishers	1. Monthly inspections will be performed on fire extinguishers. 2. Daily safety and weekly inspections will be performed on first aid kits. 3. Initial inspections will be performed on heavy equipment prior to each use. 4. Portable eye wash will be inspected monthly.	1. Personnel have read and comply with SHSP 2. Site specific training 3. Qualified operators will be used for heavy equipment operation 4. Instruct personnel on proper use of fire extinguishers 5. At least 2 individuals on-site will have current CPR and First aid training

ACTIVITY HAZARD ANALYSIS

Project: Site 4 NAWC WARMINSTER
Activity: TASK 4 - EXCAVATION/CONFIRMATORY SAMPLING
Location: WARMINSTER, PA

MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
1. Mobilization of equipment and supplies (Hazards and Controls 1-8 apply)	1. Back Injuries	1 .Site personnel will be instructed on proper lifting techniques; Mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available; Instruct personnel on proper lifting techniques.
2. Excavate soil (Hazards and Controls 1-14 and 16 apply)	2. Slips/Trips/Falls	2. Maintain work areas safe and orderly; unloading areas should be on even terrain; mark and repair if possible tripping hazards.
3. Collect soil samples (Hazards and Controls 1, 2, 5, 7, 10, and 13 apply)	3. Vehicular Traffic	3. Spotters will be used when backing up trucks, heavy equipment and moving equipment
4. Pressure wash heavy equipment (Hazards and Controls 2, 6, 7, 10, 13 and 15 apply)	4. Overhead Hazards	4. Personnel will be required to wear hard hats that meet ANSI Standard Z89.1
	5. Dropped Objects	5. Steel toe boots meeting ANSI Standard Z41 will be worn
	6. Noise	6. Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs); SHSO will determine the need for hearing protection; all equipment will be equipped with manufacturer's required mufflers
	7. Eye Injuries	7. A full-face respirator will be worn during excavation and soil sampling operations; Pressure washing requires chemical goggles and a full-faced shield
	8. Heavy Equipment (rollovers, overhead hazards, spills, struck by or against)	8. Equipment will have rollover protective structures and seat belts; operators shall wear seat belts when operating equipment; do not operate equipment on grades which exceed manufacturer's recommendations; equipment will have guards, canopies or grills to protect from flying objects; ground personnel will stay clear of all suspended loads; all slings chains and ropes will be rated for the load in which it is expected to lift; spills and absorbent materials will be readily available; drip pans, polyethylene sheeting or other means will be used for secondary containment; eye contact with operators will be made before approaching equipment; equipment will not be approached on blind sides; avoid equipment swing areas; know hand signals; all equipment will be equipped with backup alarms; no loose clothing, gauntlet-type gloves, rings or watches will be worn
	9. Fire	9. ABC type fire extinguishers shall be readily available; No smoking in work area
	10. Chemical Exposure to metals, VOs	10. Excavation operations and soil sampling will require Level C PPE; Pressure washing requires the use of tyvek, chemical resistant gloves
	11. Spills	11. Spill and absorbent materials will be readily available
	12. Underground Hazards	12. All underground utilities will be identified prior to excavation; dig safe number(s) will be logged and documented
	13. Inhalation Exposure to metals, VOs	13. Excavation activities will be conducted in Level C PPE; Air monitoring will be performed as required by SHSP
	14. Pinch/Cut/Smash	14. Cut resistant work gloves will be worn when dealing with sharp objects; all hand and power tools will be maintained in safe condition; guards will be kept in place while using hand and power tools

Project: Site 4 NAWC WARMINSTER
Activity: TASK 4 - EXCAVATION/CONFIRMATORY SAMPLING

Location: WARMINSTER, PA

MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
	15. Struck by (pressurized water stream)	15 .Proper instruction on safe use of pressure washers will be conducted; operators will not fix the hand trigger in the open position such that if the wand were left unattended, water would spray from the tip; all pressure washers will be equipped with a deadman switch.
	16. Excavation	16. All underground utilities will be identified and dig safe numbers will be logged; any excavation four feet and deeper will be monitored for oxygen, combustible gases, and toxic atmospheres prior to personnel entry. Foster Wheeler and USACE excavation procedures will be followed; excavated areas will be barricaded to prevent field personnel from falling into the open area; protective systems (sloping, benching or shoring) to prevent trench/excavation cave-in will be affected in excavations greater than five feet in depth, or if deemed necessary by a competent person; all trenching/excavation will be in accordance with the provisions of 29 CFR 1926 Subpart P; smoking or open flames will not be allowed near work areas, if open flames must be used, procedures outlined in the SHSP for hot work will be followed; hand excavation may be required to prevent rupture of tank
	17. Heat Stress	17. Provide work/rest breaks; provide shading from radiant heat; provide and encourage workers to drink fluids; perform tasks early in day, if possible; institute FW heat stress prevention program; only wear tyvec where required by hazard to be evaluated by SHSO.

EQUIPMENT USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
1. Backhoe, Excavator 2. Level C PPE 3. First Aid Kits 4. Portable Eyewash 5. Fire Extinguishers 6. Pressure Washer 7. Monitoring Equipment (CGI, PID/FID, miniRAM	1. Monthly inspections will be performed on fire extinguishers. 2. Daily safety and weekly inspections will be performed on first aid kits. 3. Initial inspections will be performed on heavy equipment prior to each use. 4. Portable eye wash will be inspected monthly. 5. Pressure washers will be inspected prior to each use. 6. Monitoring equipment will be calibrated daily (Pre and Post)	1. Personnel have read and comply with SHSP 2. Site specific training 3. Qualified operators will be used for heavy equipment operation 4. Instruct personnel on proper use of fire extinguishers 5. At least 2 individuals on-site will have current CPR and First aid training

ACTIVITY HAZARD ANALYSIS

Project: SITE 4 NAWC WARMINSTER
Location: WARMINSTER, PA
Activity: TASK 5 - BACKFILL/TOPSOIL/HYDROSEED

MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
1. Mobilization of equipment and supplies (Hazards and Controls 1-8 apply)	1. Back Injuries	1. Site personnel will be instructed on proper lifting techniques; Mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available; Instruct personnel on proper lifting techniques.
2. Backfill Excavation (Hazards and Controls 1-11 apply)	2. Slips/Trips/Falls	2. Maintain work areas safe and orderly; unloading areas should be on even terrain; mark and repair if possible tripping hazards.
3 Replace topsoil and hydroseed (Hazards and Controls 1-11 apply)	3. Vehicular Traffic	3. Spotters will be used when backing up trucks, heavy equipment and when moving equipment
	4. Overhead Hazards	4. Personnel will be required to wear hard hats that meet ANSI Standard Z89.1
	5. Dropped Objects	5. Steel toe boots meeting ANSI Standard Z87 will be worn
	6. Noise	6. Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs); SHSO will determine the need for hearing protection; all equipment will be equipped with manufacturer's required mufflers
	7. Eye Injuries	7. Safety glasses meeting ANSI Standard Z87 will be worn during backfilling operation
	8. Heavy Equipment (rollovers, overhead hazards, spills, struck by or against)	8. Equipment will have rollover protective structures and seat belts; operators shall wear seat belts when operating equipment; do not operate equipment on grades which exceed manufacturer's recommendations; equipment will have guards, canopies or grills to protect from flying objects; ground personnel will stay clear of all suspended loads; all slings chains and ropes will be rated for the load in which it is expected to lift; spills and absorbent materials will be readily available; drip pans, polyethylene sheeting or other means will be used for secondary containment; eye contact with operators will be made before approaching equipment; equipment will not be approached on blind sides; avoid equipment swing areas; know hand signals; all equipment will be equipped with backup alarms
	9. Fire	9. ABC type fire extinguishers shall be readily available; No smoking in work area
	10. Spills	10. Spill and absorbent materials will be readily available
	11. Heat Stress	11. Provide work/rest breaks; provide shading from radiant heat; provide and encourage workers to drink fluids; perfomr taks early in day, if possible; institute FW heat stress prevention program; only wear tyvec where required by hazard, to be evaluated by SHSO.

EQUIPMENT USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
1. Backhoe/Front-end Loader 2. Level D PPE 3. First Aid Kits 4. Portable Eyewash 5. Fire Extinguishers	1. Monthly inspections will be performed on fire extinguishers. 2. Daily safety and weekly inspections will be performed on first aid kits. 3. Initial inspections will be performed on heavy equipment prior to each use. 4. Portable eye wash will be inspected monthly.	1. Personnel have read and comply with SHSP 2. Site specific training 3. Qualified operators will be used for heavy equipment operation 4. Instruct personnel on proper use of fire extinguishers 5. At least 2 individuals on-site will have current CPR and First aid training

APPENDIX D

PPE SELECTION FORM

Foster Wheeler Environmental Corporation

TABLE 6.1 PERSONAL PROTECTIVE EQUIPMENT SELECTION

ACTIVITY: _____

TASK	HEAD	EYE/FACE	FEET	HANDS	BODY	HEARING	RESPIRATOR

APPENDIX E

HEAVY EQUIPMENT DECONTAMINATION FORM

DECONTAMINATION CERTIFICATE

SUBJECT:

EQUIPMENT ID: _____

_____

_____

To:

The above referenced equipment was decontaminated (Date: _____) in accordance with the requirement referenced in Section _____, of the Project Specifications.

Very truly yours,

_____

FWENC Representative

Comments: _____

_____

_____

APPENDIX F

MEDICAL DATA SHEET

Foster Wheeler Environmental Corporation

MEDICAL DATA SHEET

The brief medical data sheet shall be completed by all on-site personnel and will be kept in the Support Zone by the SHSO as a project record during the conduct of site operations. It accompanies any personnel when medical assistance is needed or if transport to a hospital is required.

Project: _____

Name: _____ Home Telephone: _____

Address: _____

Age: _____ Height: _____ Weight: _____ Blood Type: _____

Name and Telephone Number of Emergency Contact: _____

_____

Drug or Other Allergies: _____

Particular Sensitivities: _____

Do You Wear Contacts? _____

Provide A Check List Of Previous Illnesses: _____

_____

_____

What Medications Are You Presently Using? _____

_____

_____

Do You Have Any Medical Restrictions? _____

_____

_____

Name, Address, And Phone Number Of Personal Physician: _____

_____

_____

APPENDIX G

WORK RULES

APPENDIX H

WEEKLY REPORT

FOSTER WHEELER ENVIRONMENTAL CORPORATION
WEEKLY HEALTH AND SAFETY REPORT

Project Name: _____
Location: _____
Delivery Order No. _____

SITE INFORMATION	**INJURIES AND ILLNESSES**
Week Ending:	Yes or no (circle)
Hours Worked:	Describe and attach reports:
Level Of Protection: B C D (circle)	

MAJOR ACTIVITIES CONDUCTED THIS WEEK
(drum handling, sampling, excavation, abatement/T&D, etc.)

SIGNIFICANT EVENTS THIS WEEK
(regulatory visits, equipment malfunctions, process start-up or shut down)

FUTURE ISSUES
(schedule, manpower allocation, monitoring equipment, other resources needed)

SITE AUDIT/INSPECTIONS CONDUCTED Yes or No (circle)
(describe outstanding findings and attach results)

AIR MONITORING:

Real Time

Major Activity	Location(s)	Worker Occupation	FID/PID Range	CGI/O2 Range	PDM Range	Other

PERSONAL AIR MONITORING

Analyte	Activity Monitored	Occupation	Location	Result	Type of Sample*

SUBCONTRACTORS ON SITE

Company Name	Task or Function	Return to Site Next Week (Y/N)

Health and Safety Officer - Signature

Date